REMARKS

By the present Amendment, claims 1-7 have been cancelled without any prejudice or disclaimer to the subject matter recited therein. Claims 8-13 are newly presented for consideration. Accordingly, claims 8-13 are now pending in the application. Claim 8 is independent.

In the Office Action of December 15, 2006, claims 1-7 were objected to because of various informalities. Claims 1, 2, and 4-7 were rejected under 35 USC §103(a) as being unpatentable over Japanese Patent Publication No. JP 2002-063927 to Yamamoto et al. ("Yamamoto") in view of U.S. Patent Application Publication No. 20004/0095023 to Jacobson et al. ("Jacobson"). Claim 3 was rejected under 35 USC §103(a) as being unpatentable over Yamamoto in view of Jacobson and further in view of U.S. Patent Application Publication No. 2002/0131285 to Kawakami and U.S. Patent Application Publication No. 2003/0159865 to Schmidt.

The cancellation of claims 1-7 has rendered these particular grounds of objections and rejections moot.

By the present Amendment, Applicants have introduced claims 8-13 to better define the claimed invention and identify the features that are not shown or suggested by the art of record. Independent claim 8 defines a fuel cell system control unit that comprises:

> a first converter electrically connected to an electric power system through a circuit-breaker means;
>
> an electric load connected to an electric line which ties the electric power system and the first converter;
>
> a set of fuel cells connected to a DC circuit of said first converter through a second converter;

a secondary battery connected to said DC circuit through a third converter;

a current detecting means which detects AC currents from said converters and outputs their detected values;

a voltage detecting means which detects an AC voltage on the power system side of said circuit breaker means;

a receiving current detector for detecting the receiving current;

means for calculating a receiving electric power based on the detected receiving current and the AC voltage;

means for calculating the output power of the first power converter;

means for calculating the load power which the load consumes based on the receiving power and the output power of the first power converter; and

means for controlling the first-third power converters so that the output power of the first power converter approaches the load power.

According to independent claim 8, the fuel cell system control unit includes a first converter that is electrically connected to an electric power system through a circuit breaker means. An electric load is connected to an electric line which ties the electric power system to the first converter. A set of fuel cells is connected to the DC circuit of the converter through a second converter. A secondary battery is connected to the DC circuit through a third converter. A current detecting means is provided to detect AC currents from the converters and output their detected values. A voltage detecting means detects AC voltage on the power system side of the circuit breaker means, while a receiving current detector detects the receiving current. The fuel cell system control unit includes means for calculating a receiving electric power based on the detected receiving circuit and the AC voltage, means for calculating the output power of the first power converter, and means for calculating the load power which the load consumes based on the received power and the

output power of the first power converter. Additionally, the unit includes means for controlling the first-third power converters so that the output power of the first converter approaches the load power. According to such an arrangement, it is possible to control the receiving electric power from the electric power system to be equal to the target voltage.

The Office Action had previously indicated that Yamamoto disclosed numerous features that were recited in independent claim 1. The Office Action admits, however, that Yamamoto did not teach detecting the currents and voltages, and calculating the power at particular points in the circuit. Jacobson was relied upon for teaching these particular features. The Office Action further indicated that Yamamoto and Jacobson combined still failed to explicitly teach how the converters control the output of power, and the type of load that is being powered. Kawakami was relied upon for disclosing a PWM controller which controls the output of converters via pulse width modulation of voltage references. Schmidt was relied upon for disclosing a load of a fuel cell system being a motor/generator as well as a control unit for controlling operation of the motor/generator. Applicants respectfully disagree.

Yamamoto discloses a fuel cell system that contains means for increasing fuel to the fuel cell according to the increase of current between the fuel cell and a load. Additionally, a secondary battery is charged in order to reduce the delay when the electric load increases. An auxiliary pump powered by commercial power or power from the fuel cell system is provided to actuate the fuel cell. The auxiliary pump subsequently supplies hydrogen gas to the fuel cell. Thus, power for the electric load is detected directly from the load current and voltage. This arrangement is particularly susceptible to faulty readings of the load power because

of errors occurring in the electric power detection means and/or the electric power loss resulting from consumption by the equipment and system. The receiving power is subsequently obtained as the sum of a target value of the receiving power plus the error or loss in electric power. Since the electric power for the error is supplied from the electric load on the electric power side, the receiving power can never be controlled to reach the actual target value.

In contrast to this arrangement, the present invention, as defined by independent claim 8, provides a system for controlling the receiving electric power to the actual target value. First, means are provided for calculating the load power which the load consumes based on the receiving power and the output power of the first converter. Additionally, means are provided for controlling the first-third power converter so that the output power of the first power converter approaches the load power. By applying both of these features, the fuel cell of the instant invention does not need to detect the electric power of the electric load directly. Therefore, if there are errors resulting from the equipment/system, the receiving electric power can still be controlled to the desired value without being influenced by such errors.

The art of record simply fails to provide any disclosure or suggestion for features recited in independent claim 8, such as:

> means for calculating the load power which the load consumes based on the receiving power and the output power of the first power converter; and
>
> means for controlling the first-third power converters so that the output power of the first power converter approaches the load power.

It is therefore respectfully submitted that independent claim 8 is allowable over the art of record.

Claims 9-13 depend from independent claim 8, and are therefore believed allowable for at least the reasons set forth above with respect to independent claim 8. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

For the reasons stated above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a Notice of Allowance is believed in order, and courteously solicited.

If the Examiner believes that there are any matters which can be resolved by way of either a personal or telephone interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

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AUTHORIZATION

Applicants request any shortage or excess in fees in connection with the filing of this paper, including extension of time fees, and for which no other form of payment is offered, be charged or credited to Deposit Account No. 01-2135 (Case: 520.43324X00).

Respectfully submitted,
ANTONELLI, TERRY, STOUT & KRAUS, LLP.

Leonid D. Thenor
Registration No. 39,397

LDT/vvr
1300 N. Seventeenth Street
Suite 1800
Arlington, Virginia 22209
Tel: 703-312-6600
Fax: 703-312-6666

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